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POWDERY MILDEW OF ROSES

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Powdery mildew is a serious rose disease, and when discovered in a planting, measures must be taken immediately to check its further spread. Few rose gardens containing mixed varieties remain free of the disease for any great length of time. Varieties differ greatly in resistance to the disease, although nearly all types of roses, including the wild roses, Hybrid Teas, Hybrid Perpetuals, and climbers are more or less susceptible. The Dorothy Perkins and Crimson Rambler varieties are particularly subject to this disease. The following varieties approved for Florida growing are regarded as mildew-resisting: TEAS, Maman Cochet, Alexander Hill Gray; HYBRID TEAS, Antoine Rivoire, Joseph Hill, Mrs. Aaron Ward; POLYANTHAS, Cecile Brunner; and CLIMBING, American Pillar, Dr. Van Fleet. The planting of particularly susceptible varieties under most conditions should be avoided.

CAUSE

Two powdery mildew fungi attack roses, although one of these* is generally considered the most frequent cause of the disease. In the presence of sufficient moisture, spores present on the leaves, stems, or blossoms germinate, and the growth therefrom soon results in a network of slender branching threads over the surface. Certain branches penetrate within the host tissue and absorb nourishment to sustain the fungus. The attacked cells swell at first, causing distortion of the affected parts, and soon die. In addition, upright branches are produced which bud off countless numbers of white, oval-shaped spores. The accumulation of these spores on the surface of the plant causes the powdery appearance from which the disease derives its name. After a destructive vegetative period, the fungus sometimes forms a second type of fruiting structure which, when mature and abundant, appears as tiny, black dots scattered over the network of threads. Within these black fruiting bodies are produced a second type of spore which is more resistant to cold and other environmental conditions unfavorable to the fungus. However, with temperatures not too severe, the fungus may winter over in either stage of development. The fact that the greater portion of the powdery mildew fungus is on the outside

**Sphaerotheca pannosa* (Wallr.) Lev.

of the leaves and stems rather than on the inside makes it vulnerable to control measures.

SYMPTOMS

The disease first appears as grayish or whitish spots on young leaves and shoots. These spots become raised and blister-like, particularly on the younger tissues. Under humid and poorly ventilated conditions the disease develops rapidly, and soon the leaves, young stems, thorns, and buds become more or less covered with the white, powdery growth of the invading fungus. Frequently, young leafy shoots and other growing tips are completely coated. Portions of infected plants or at times entire plants appear as though they were dusted with some white powder. Dwarfing, curling, and other malformations of leaves, stems, and buds take place, and soon the infected tissues become parched and brown. In advanced stages of the disease the white, mildew appearance becomes less conspicuous or entirely lost. Death of the plant seldom results, although the disease interferes seriously with its development and flowering.

CONTROL

Good ventilation is important in the prevention of powdery mildew. Plants pruned to an open type of growth, well spaced, and set away from walls or buildings dry quickly and are less subject to mildew. Rose varieties differ greatly in susceptibility to the disease, and selections may be made of less susceptible types as mentioned above.

Since the powdery mildew fungus lives almost entirely on the outside of the host tissues, it may be eradicated from diseased parts after once becoming established. Immediately upon discovery the diseased bush, as well as all bushes situated nearby, should be completely covered with a suitable fungicide. Additional applications should be made at weekly intervals until all traces of the disease have disappeared, although three applications are usually sufficient.

Only the sulfur-containing fungicides have proved effective in combatting powdery mildew. If a sulfur fungicide has been applied to the bushes frequently to control other rose diseases, powdery mildew is not likely to appear. Many suitable preparations may be obtained in either dust or liquid form. If a dust is preferred, only high-grade dusting sulfur of sufficient fineness to pass readily through a 300-mesh screen should be used. Such a dust may be easily applied and thoroughly distributed in small amounts. Finely divided sulfur and arsenate of lead in the proportion of 90 parts sulfur to 10 parts lead arsenate is a satisfactory combination. Dusts containing nicotine and in either the yellow or green colored forms may be obtained. Most of the liquid sulfur compounds are effective against mildew. However, they usually discolor the foliage badly, and burning sometimes results from their application. These disadvantages are largely overcome by using a spray solution consisting of one ounce potassium sulfide (liver of sulfur) to three gallons of water.